

Relevant Sections of Chapter 691, Rules for Underground Storage Facilities

Section 12. Discharge and Leak Investigation, Response and Corrective Action Requirements

A. General requirements:

- (1) In accordance with 38 MRSA § 568, any facility owner or operator or other responsible party, as defined in 38 MRSA § 562-A(17), when a leak, spill or other prohibited discharge of oil occurs, shall immediately undertake to remove that discharge to the satisfaction of the commissioner, and in accordance with the requirements of this section. In determining the extent of a corrective action, the commissioner and his staff shall consider the potential for human exposure and for adverse effects on public safety, health and welfare as well as the environment.
- (2) Any evidence of a possible leak or discharge of oil as defined in section 5(D)(10) of this rule, any spill or overfill, or any other discharge of oil must be reported to the commissioner within 24 hours of discovery. Notwithstanding the above, discharges of 10 or less gallons of oil that occur above the surface of the ground, and that do not reach ground water or surface waters of the State, need not be reported to the commissioner if the owner or operator complies with all of the following requirements:
 - (a) The discharge is cleaned up within 24 hours of discovery.
 - (b) A written log is maintained at the facility or the owner's place of business in Maine recording for each discharge, the date of discovery, its source, the general location of the discharge at the facility, the date and method of cleanup, and the signature of the facility owner or operator certifying the accuracy of the log.
 - (c) The log is readily available for inspection by personnel and authorized agents of the commissioner.

NOTE: Discharges of oil may be reported by calling the department's toll free telephone number, 1-800-482-0777.

- (3) Any person who causes, or is responsible for, a discharge to ground water in violation of 38 MRSA section 543, is not subject to any fines or penalties for violation of section 543 for the discharge if that person promptly reports and removes that discharge in accordance with this rule as well as other rules or orders of the commissioner and the board.
- (4) All corrective action plans required under this section must be certified by a Maine certified geologist, a registered Maine professional engineer, or a geologist or engineer otherwise in compliance with the Maine professional regulation statutes for geologists or engineers. Geological and hydrogeological interpretations must be certified by a geologist. Contaminated soil and ground water treatment system design plans must be stamped by an engineer. Implementation of corrective actions must be supervised by a Maine certified geologist, a Maine registered professional

engineer, or an engineer or geologist otherwise working in compliance with Maine's professional regulation statutes. Individuals providing the above professional services should be knowledgeable in underground oil storage facility investigation and remediation.

- (5) Leaks and discharges of oil shall be investigated and corrected using techniques that are cost-effective, reliable and technically feasible.
- (6) Upon determination that an oil discharge has occurred at a facility, that facility may resume partial or full operation while corrective action is taken unless the commissioner determines that a return to operation would interfere with investigation and remediation efforts, and would therefore result in a threat to public health and safety and the environment.

B. Leak investigation and confirmation requirements:

- (1) The facility owner or operator, or other responsible party shall immediately investigate and confirm all suspected leaks, spills or other discharges of oil to the commissioner's satisfaction within 20 business days of discovery, or another reasonable time period approved by the commissioner, using the following steps or another procedure approved by the commissioner:
 - (a) Leak detection check. If the facility has leak detection in accordance with this rule and it indicates a possible leak, a check for failures of the leak detection system may be conducted prior to precision testing if the check is concluded within 3 business days of the initial discovery of evidence of a possible leak or discharge. All components of the leak detection system for tanks and piping must be checked for proper operation, recalibrated if an automated or electronic system, and monitored in accordance with the requirements of this rule and if applicable, the manufacturer's instructions. Monitoring must be conducted for 5 consecutive days. For manual leak detection systems, monitoring must be conducted daily. Records of the findings of the leak detection check and monitoring must be provided to the commissioner. If leak detection monitoring results are conclusive and do not indicate a leak, further investigation is not needed, unless there is other environmental contamination or physical evidence indicating a leak or discharge of oil. If the leak detection results indicate a leak, are inconclusive or the facility does not have leak detection meeting the requirements of this rule, the owner, operator or other responsible party shall conduct a precision test of the facility in accordance with subparagraph b. If leak detection indicates a leak, the owner, operator or other responsible party shall abandon, repair or replace facility components in accordance with appropriate sections of this rule. In addition the owner or operator of a motor fuel facility shall also comply with the testing and replacement procedures outlined below in paragraph (d) below.

NOTE: Performing an additional statistical inventory analysis is not an acceptable option under the leak detection check requirements because of the delay to collect the 30 to 60 days of daily product inventory data required by this method.

- (b) Precision test. When a possible leak is not attributed to a failure of the leak detection system under subparagraph a the owner, operator or other responsible party shall have a precision test conducted of the facility to determine whether and where a leak exists. This test shall be conducted by an independent third party. If an initial precision test is either inconclusive or indicates a failure, the owner or operator may recheck the results by re-testing within two weeks of receipt of the initial test results. A copy of all precision test results must be submitted to the commissioner by the facility owner and the tester.
 - (i) If precision testing indicates a leak (2 test failures or a single uncontested test failure), the owner, operator or other responsible party shall abandon, repair or replace facility components in accordance with appropriate sections of this rule and initiate a site assessment in accordance with paragraph 1(c) below and undertake corrective actions as specified in subsection C below. In addition, the owner or operator of a motor fuel facility shall also comply with the replacement procedures outlined below in paragraph (d) of this section.
 - (ii) If results from a commissioner-approved and properly conducted precision test of the facility conclusively indicates that a leak does not exist, and if no environmental contamination or other physical evidence is the basis for suspecting a leak or discharge, further investigation is not required. The commissioner may, however, require additional precision testing or an in-situ site assessment in accordance with paragraph (c) below for environmental contamination by oil if initial precision tests are inconclusive or improperly conducted.
 - (iii) The facility owner, operator or other responsible party shall conduct a site assessment as described below in sub-paragraph c of this section if precision test results do not indicate a leak exists but evidence of environmental contamination or other physical evidence is the basis for suspecting a leak.
- (c) Site assessment.
 - (i) The objectives of the site assessment are as follows:
 - (a) Determine the presence or absence of a leak or oil discharge where contamination is most likely to be present on the facility site;
 - (b) Identify the presence of free product and soils contaminated above the notification levels in Appendix P of this rule;
 - (c) Determine the degree of a threat to ground water quality; and
 - (d) Consider the nature of the oils stored at a facility, the cause for suspecting a leak or discharge, the type of backfill and soils, the depth of ground water, the depth of bedrock, and other factors appropriate for identifying the presence and source of a leak or other discharge.
 - (ii) The site assessment must be conducted in accordance with procedures outlined in Appendix P of this rule. To verify the presence or absence of a leak or oil discharge at an operating facility in follow-up to the requirements

of paragraphs (b)(ii) or (iii) above, in-situ hydrogeological investigation procedures outlined in paragraph 7 of Appendix P must be followed.

- (iii) If site assessment results for the excavation zone and other areas of the facility site indicate that a leak, spill or other discharge of oil has occurred, the owner or operator shall properly abandon, repair or replace facility components and begin corrective actions in accordance with subsection C below.
 - (iv) If the site assessment results for the excavation zone and other areas of the facility site do not indicate a leak, spill or other discharge of oil has occurred, further investigation is not required.
- (d) If replacement or removal is required as a result of a corrosion-induced leak in an unprotected steel tank, the owner or operator of the facility may either replace all other tanks and piping at that facility not meeting the design and installation standards set forth in section 5(B) of this rule or comply with all of the following:
- (i) Remove all bare steel and asphalt-coated steel tanks at the facility that are more than 20 years old. For the purposes of this subsection, where the age of a tank cannot be reasonably determined, all tanks will be assumed to be 20 years old as of May 1, 1986.
 - (ii) Perform a statistical inventory analysis of the entire facility and submit the results of that analysis to the commissioner, in accordance with the requirements of section 5(D)(2). If a statistical inventory analysis of the entire facility has been performed within 60 days prior to the required removal, then the results of that analysis may be submitted to the commissioner instead. If the results of the statistical inventory analysis for any portion of the facility indicates evidence of a possible leak or that the data are not sufficiently reliable to make a determination that the facility is or is not leaking according to the requirements of section 5(D)(2)(c), the commissioner may require that all remaining tanks and piping at the facility be precision tested, unless it can be demonstrated that the same tanks and piping passed a precision test meeting department specifications within the previous 6 months; and
 - (iii) Results of all precision tests conducted pursuant to (ii) above, must be submitted to the commissioner by the facility owner and the tester, and all tanks and piping found to be leaking must be removed pursuant to section 11 of this rule.
- (e) Within 30 working days of discovery of evidence of a possible leak or another time period approved by the commissioner, the owner, operator or other responsible party shall submit a report on the steps taken and the findings of leak investigation and confirmation efforts. The report must include the name, address, and telephone number of the person to contact for more information, and a site assessment report meeting the requirements of Appendix P except that the reporting deadline is as specified above in this subparagraph.

NOTE: 38 MRSA, subsection 568(6), allows for reimbursement by the department of documented removal costs incurred by a tank owner or operator where a tank or facility was required by the commissioner to be removed or closed upon evidence of a leak or discharge, but later determined by a site assessment or hydrogeological investigation not to be a source of a leak or oil discharge. The facility owner or operator under these circumstances also may apply for economic damages such as loss of income through the 3rd party damage claim process outlined in 38 MRSA, section 569-A.

C. Minimum corrective action requirements

(1) Initial response and abatement measures

- (a) Identify and mitigate fire, explosion and vapor hazards to the satisfaction of the commissioner and the local public safety agency having jurisdiction within 24 hours of discovery of a leak or discharge or another time period approved by the commissioner.
- (b) Take immediate action to prevent any further discharge of oil from the facility to the environment within 24 hours of discovery of leak or discharge, or another time period approved by the commissioner. This includes ceasing use and removing from those tanks and associated piping suspected or tested to be leaking as much oil as necessary to entirely stop the discharge. All tanks and piping shall be abandoned in accordance with section 11.
- (c) Remove the tanks and associated piping as soon as possible in accordance with section 11 of this rule except that compliance with the waiting period between notification and abandonment is hereby waived.
- (d) Prevent further migration of oil into surrounding soils and ground water and surface water, including the removal of any free product in the vicinity of the tanks and piping or other source of leak or discharge. Recovery of free product shall be initiated immediately upon discovery and followed by submission of a free product abatement plan, meeting the requirements of paragraph 2 of this subsection, minimum corrective actions.
- (e) Continue to monitor and mitigate any additional fire and safety hazards posed by vapors or free product that has migrated from the excavation zone and entered into structures, sewers and utility conduits.
- (f) Soil remediation. Remediate all oil saturated soils and all soils contaminated above an action level established by the commissioner on a case by case basis, and measured by laboratory analyses and using the field headspace vapor measurement technique described in Appendix Q or another field analytical technique at least as accurate and sensitive approved by the commissioner. Prior to the filling of any tank or piping excavation, an adequate number of soil samples must be collected for laboratory analysis to determine whether additional soil remediation is required by the commissioner. A minimum of 2 such samples must be collected at a minimum-from soils to be analyzed by the field headspace technique and to bracket the range of hydrocarbon concentrations found in the field, and analyzed in a laboratory. Acceptable laboratory methods and

performance standards to be used to analyze soil samples are found in Appendix S. In cases involving low risks of public exposure or of damage to important ground water resources, the commissioner may approve an exception to the soil sample testing requirements above. To expedite remediation decisions in such cases, the commissioner may rely solely on approved field analytical methods and test data in making soil remediation decisions without laboratory confirmation analyses.

- (g) Soil treatment. The method and location of contaminated soil treatment or processing (in-situ or above ground) must be approved by the commissioner and, if to be treated off the facility site, must comply with applicable regulations administered by the department.
- (h) Soil disposal. Oil contaminated soils may be disposed at a Maine landfill that is specifically licensed by or otherwise has been approved by the commissioner or department for such disposal or treatment. This paragraph does not preclude disposal at a properly licensed out of state disposal or treatment facility.
- (i) Sampling water supply wells. The closest water supply wells to the facility, private or public, located at or surrounding the facility in all directions and within 1000 feet of the facility must be sampled and analyzed for gasoline, heating oil, diesel fuel hydrocarbons, benzene or MTBE as required by the commissioner. When wells are found contaminated, sampling must continue to the next furthest well(s) in the same general direction from the facility until it is certain all water supplies contaminated by a leak or discharge are identified. The commissioner may require other water supplies suspected to be contaminated to also be sampled. The owners of all wells sampled shall be provided with a copy and explanation of the results within seven days. If a public drinking water supply is found to be contaminated, the Bureau of Health in the Maine Department of Human Services must be notified within 24 hours of discovery. Water samples must be analyzed in accordance with the requirements of Appendix S.
- (j) Treatment of contaminated private water supply wells. Owners of private water supplies found to be contaminated shall be offered and provided with point-of-entry (POE) water treatment within 15 days of the discovery of contamination. Such treatment shall reliably reduce the level of contamination below primary drinking water standards and Maine Bureau of Health maximum exposure guidelines. For water supplies contaminated with gasoline or heating oil below 1 ppm or MTBE below 100 ppb, two granulated activated charcoal filters installed in series may be used. Contamination above these levels requires treatment by aeration. Other point-of-entry treatment systems may be used when demonstrated to be effective and reliable in reducing oil contamination and approved by the commissioner. If treatment does not reduce contamination levels below required health standards, the commissioner may require different or additional interim remedial measures to avoid human exposure to oil contaminants.
- (k) Treatment of contaminated public water supplies. The commissioner may require contaminated public water supplies wells to be provided by the owner, operator or other responsible party with treatment adequate to reduce oil concentrations below primary drinking water standards and Maine Bureau of

Health maximum exposure guidelines. The treatment system must be designed by a professional engineer registered in Maine or working in conformance with Maine professional regulation statutes and rules, and be approved by the commissioner, the Maine Bureau of Health and the public water supply owner.

- (l) Water supply monitoring requirements.
 - (i) Affected water supplies must be monitored by sampling once every 3 months before, between and after treatment devices for as long as the system is operating. Water shall be analyzed for total gasoline and benzene, total heating oil, diesel oil or other applicable parameters as required by the commissioner. Water supply sampling and analyses must be conducted in accordance with Appendix S.
 - (ii) Water supplies found to be contaminated with oil below established health standards must be monitored every 3 months for total gasoline hydrocarbons and benzene, total heating oil hydrocarbons or other applicable parameters required by the commissioner. Water supplies located in close proximity to and adjoining to contaminated ones must, along with other wells deemed by the commissioner to be at significant risk of contamination, also be monitored in accordance with the above requirements.
 - (iii) Monitoring of contaminated water supplies and supplies deemed at significant risk of contamination must continue until either use of the supply is discontinued, four (4) consecutive quarterly monitoring results do not detect contamination by oil or its components, or monitoring is suspended by the commissioner because in his judgment it is no longer needed.
 - (iv) Monitoring results must be provided to the commissioner and the water supply owner within 7 days of receipt.
- (m) Point-of-entry treatment devices must be maintained in proper operating condition until completion to commissioner satisfaction of a potable replacement drinking water supply or the completion of long-term correction actions and settlement of third party damage claims.
- (n) Within 30 days after confirmation of a leak or other discharge of oil, the owner, operator or other responsible party shall submit a written report to the commissioner summarizing the initial response and abatement measures taken, their effectiveness, any resulting data or laboratory analyses, documentation that affected parties and the Maine Bureau of Health have been properly notified and the need for hydrogeological characterization and investigation of the extent of contamination, or for additional abatement measures.
- (o) Upon consideration of the level and type of contamination, the sensitivity of the geological setting of the facility, the presence of possible receptors, and proximity to important ground water or surface water resources; the commissioner may require an hydrogeological investigation in accordance with paragraph 4 below as well as additional initial abatement measures.

- (2) Free product recovery. Free oil product must be recovered or removed to the satisfaction of the commissioner at all sites where found. A free product abatement plan shall be submitted for the review and prior approval of the commissioner. The free product abatement plan must be submitted within 30 days of discovering free product or another time period approved by the commissioner. Such a plan must include, at a minimum:
- (a) Methods for product control. Control of free product migration and the removal or recovery of all free product that is technically feasible shall be the minimum objectives of any abatement plan. Free product removal or recovery must be conducted in a manner that minimizes the spread of contamination into previously uncontaminated zones using techniques appropriate to the hydrogeological conditions of the site, and that properly treats, discharges or disposes of recovery byproducts.
 - (b) Methods to handle any flammable products in a safe and competent manner to prevent fires or explosions.
 - (c) The name of the person(s) responsible for implementing free product removal or recovery procedures.
 - (d) The estimated quantity, type and thickness of free product observed or measured in wells, bore holes and excavations.
 - (e) The location of any discharge of dissolved phase oil contaminated water. Any discharge of free oil product or a free product and water emulsion is prohibited.
 - (f) The type of treatment to be applied to and the effluent quality expected from any discharge.
 - (g) The disposition and handling of recovered free product.
 - (h) If removal is to include soil gas venting, the quality and quantity of expected air emissions.
- (3) Hydrogeological investigation of the extent of contamination.
- (a) The objectives of the initial hydrogeological investigation are to characterize the geology of the facility and the surrounding area, to determine the concentration and extent of soil and ground water contamination, to determine the direction and rate of contamination movement, to identify what resources and receptors are at significant risk of contamination and to determine the need for and the objectives of long-term corrective actions. The initial hydrogeological investigation study must cover the facility site and those areas known or suspected to be contaminated by oil.
 - (b) The following existing data, where available, must be compiled and reviewed.
 - (i) Soils maps;
 - (ii) Aerial photographs;

- (iii) Well logs for all contaminated wells and wells on properties abutting a parcel with a contaminated well and all other wells within 500 feet of the facility;
 - (iv) A property tax map or other base map at a scale of 1"=500' or less showing existing structures, property ownership, surrounding land uses, rights-of-way, roads, existing underground utilities and public and private water supply wells that are contaminated, on a land parcel abutting a parcel with a contaminated well or within 1000 feet of the facility;
 - (v) Surface water bodies, including intermittent streams, wetlands and flood plains;
 - (vi) Regional bedrock geology; and
 - (vii) Surficial geology.
- (c) Fracture trace analysis. Conduct a fracture trace analysis if contamination of ground water in the bedrock is documented or likely. The analysis must include measurement of fractures observed in bedrock outcrops and on aerial photographs, on a site plan, a U.S. Geological Survey quadrangle, a rose diagram or a polar plot. The relationship between observed fracture patterns to well yields and contamination movement must be determined. A summary and analysis of available published studies of bedrock fractures relevant to the investigation site also must be provided.
- (d) Develop ground water and contamination contour maps of the facility using existing wells, where available and at least 4 ground water monitoring wells located in the surrounding impacted area, one of which must be located upgradient (dry wells do not count toward the 4-well minimum). The maps must include the location of ground water monitoring wells, ground water elevations (measured to the nearest one hundredth of a foot), ground water contours, contamination levels and contours, current and past locations of tanks and piping, location of subsurface waste disposal system and any dry wells, and the locations of sewer and any other underground utility lines.
- (e) The following minimum data must be collected and logged during the boring of ground water monitoring wells:
- (i) Soil and subsoil conditions and types (described using the unified soil classification system);
 - (ii) Presence and depth of confining strata;
 - (iii) Presence, depth of free oil products;
 - (iv) Depth of water table;
 - (v) Presence and depth of bedrock; and

- (vi) Continuous split spoon logging screening for oil contaminated soils above the water table with a flame or photo ionization field sampling instrument, using the methodology outlined in Appendix Q or another technique of comparable precision and reliability approved by the commissioner.
- (f) Water quality sampling and analyses requirements are:
 - (i) Each well must be properly developed and allowed to stabilize prior to sampling;
 - (ii) Samples must be collected in accordance with the department "Ground Water Sampling Manual for Underground Tank Sites" or by another collection method approved by the commissioner;
 - (iii) Samples must be analyzed in a laboratory for total gasoline or total heating oil, as appropriate, or by another comprehensive hydrocarbon laboratory method approved by the commissioner;
 - (iv) Whenever gasoline contamination is suspected, sample analyses must include methyl tertiary butyl ether (MTBE) and benzene;
 - (v) Laboratory analysis of water samples must be conducted in accordance with the requirements of Appendix S; and
 - (vi) At least 2 complete rounds of sampling are required from all monitoring points, including surrounding water supply wells, at least one month apart.
- (g) Nearby surface water bodies likely to be affected must be sampled for oil contamination.
- (h) Within 90 days of a commissioner request to perform a hydrogeological investigation, or another time period approved by the commissioner, the owner, operator or other responsible parties shall submit a report of the findings and conclusions of the initial hydrogeological investigation to the commissioner for review and approval. The following data, results and conclusions must be included in the report:
 - (i) Data and sample collection and analysis methods used;
 - (ii) Hydrogeological site description addressing the general geological setting of the site, potential and present contamination hazards, bedrock and overburden interconnection, extent and location of ground water and soil contamination, the direction and rate of contamination migration, ground water and surface water resources at risk of contamination, identification of water supply wells contaminated or at imminent risk of contamination, and identification of receptors at risk of hydrocarbon vapor problems;
 - (iii) Soil, ground water and surface water quality data, including all field and laboratory data, and the relationship of measured contaminant levels to State of Maine and federal allowable contaminant standards or guidelines;

(iv) Minimum data and findings to be presented in tables, figures or appendices:

- (a) Detailed site/locus map;
 - (b) Sufficient geologic maps or cross sections to illustrate the site's geological setting;
 - (c) Ground water contour map;
 - (d) Map of bedrock fractures and lineaments;
 - (e) Geophysical survey map, if any;
 - (f) Table or map showing water quality sampling results;
 - (g) Soil sampling results;
 - (h) Boring logs and well installation details; and
 - (i) All testing laboratory reports and results.
- (v) Recommendations addressing the need and objectives for additional hydrogeological investigation or monitoring, and the need for additional immediate abatement measures and/or corrective actions for long-term remediation of oil discharges;
- (vi) Upon review of the initial hydrogeological investigation study report, the commissioner may require the owner, operator or other responsible party to undertake further investigations to determine the need and feasibility of long-term corrective actions, or the commissioner may require responsible parties to undertake long-term corrective action in accordance with paragraph D below of this section.

D. Long-term corrective actions may be required to provide replacement potable drinking water, to mitigate the risk of contamination to private and public drinking water supplies or important ground water or surface water resources, to prevent human exposure to petroleum vapors, to control fire and explosion hazards, to protect or restore important biological resources, and to otherwise protect the public health, safety and the environment. Because of the site specific needs and objectives of long-term corrective actions, the owner, operator or other responsible party may be required by the commissioner to submit for approval a long-term corrective action plan. The schedule for submitting, the format, additional information needs, the overall contents and the objectives of the long-term corrective action plan will be determined by the commissioner on a site by site basis.

E. Public information and participation requirements:

- (1) At the time of submission to the commissioner, copies of the leak investigation and confirmation report, the initial response and abatement report, the free product abatement plan, the initial hydrogeological investigation report and the long-term corrective action plan must be sent by certified mail by the owner, operator or other

responsible party to the chief municipal officer with jurisdiction or the county commissioners if in an unorganized township, who are responsible for ensuring these documents are available to the public for inspection at the municipal or county offices. The leak investigation and confirmation report and free product abatement plan also must be provided to the local fire chief with jurisdiction.

- (2) The owner, operator or other responsible party shall provide a copy of the leak investigation and confirmation report by certified mail to owners of land parcels abutting the facility and to holders of an easement or a right-of-way for an underground utility conduit on the facility or along a public or private road abutting the facility.
 - (3) Prior to approving a long-term corrective action plan, the commissioner may hold a public meeting to inform and to solicit comments from impacted residents, abutting landowners and local officials. The commissioner shall provide written notice 7 days in advance of such a meeting to affected parties, including at a minimum impacted residents and the chief municipal officer, and the responsible parties, if known. When a long-term corrective action effort is to be terminated prior to meeting the objectives of the long-term corrective action plan, the commissioner shall provide written notice by certified mail to the chief municipal officer with jurisdiction or the county commissioners if an unorganized township, and to residents who have suffered oil contamination.
- F. When technically feasible and cost effective, the commissioner may require ground water sample location and quality data to be submitted in electronic format compatible with the Maine Geographic Information System and Ground Water Database. The format shall be provided by the commissioner.
- G. Nothing in this section limits department authority or discretion under 38 MRSA § 568 to order or undertake immediate remedial or corrective action at sites where evidence of contamination by oil is present.
- 13. Severability.** If any provision of this rule is declared invalid or ineffective by a court decision, the decision does not invalidate any other provision of this rule.

Appendix H: Procedures for Weekly Monitoring, Handling, and Obtaining Samples for Laboratory Analysis

These procedures are specifically for manual sampling of ground water monitoring wells used as leak detection to meet the requirements of section 5(D)(13) of this rule.

NOTE: Due to the extreme sensitivity of laboratory analytical equipment, it is very important that all bailers, pumps and sample vials be kept clean. A contaminated pump or bailer may cross-contaminate monitoring wells or falsely indicate the presence of hydrocarbons in the ground water. It is also important that the person taking the sample have clean hands free of any grease, oil or gas.

For Weekly Monitoring Perform Steps 1 through 7.

1. All equipment used shall be washed with a detergent soap and triple rinsed with water which is known to be uncontaminated to ensure the device is clean. The individual(s) performing the sampling shall wash their hands thoroughly prior to sampling.
2. Measure and record the distance from the top of the casing to the water surface.
3. Measure and record the distance from the top of the casing to the bottom of the well.
4. After checking for free product using a clear bailer and when the volume of water in the well is sufficient remove several bailer volumes of water.
5. Lower the bailer into the well and remove a sample. Pour the contents of the bailer into a clear container.
6. Inspect the sample for free product or an oily sheen. Smell the sample for olfactory evidence of oil.
7. Record the results in a log book which shall be kept at the facility. A sample log sheet is attached in Figure 3.

NOTE: Commercially available pastes, which change color upon contact with hydrocarbons can be spread on a weighted, plastic tape measure or measuring stick and lowered the depth of the well. Pastes are also available which will change color upon contact with water. The use of these pastes are an acceptable method of determining water levels and detecting product in monitoring wells for the purpose of complying with weekly monitoring requirements. The use of an oil/water interface probe is also acceptable.

8. Prior to obtaining samples for laboratory analysis, remove 3 well volumes of water from each well. The water may be removed by bailing or pumping the well. For 2-inch wells, remove about 2.5 gallons of water for every 5 feet of well water.
9. After a sufficient volume of water has entered the well, take a sample for analysis.
10. Samples shall be poured into vials designed for sampling volatile organics. Standard sampling vials are glass, 30-50 milliliters in volume with a Teflon cap. Obtain the sample vials from the lab where the analysis will be performed. Care shall be taken, such that no air

bubbles are in the sample vial. Record the sample vial number and the monitoring well number, such that the laboratory analysis may be correlated to a specific well location.

11. Samples shall be securely packed and shipped the same day or in accordance with the protocols for the analysis being conducted. Samples shall be kept cool and not exposed to heat. A record shall be kept of all dates and shipping arrangements. Samples must be analyzed in accordance with the requirements of Appendix S of this rule.
12. For monitoring wells which are installed with the impervious barrier, which contains less than two (2) feet of water, do not attempt to remove three well volumes of water. It may be necessary to sample the well during or after periods of rain whenever possible.
13. For monitoring wells which do not have enough water to obtain a sample, measure the depth of the well to insure the well is not filled in or has not collapsed. Using a gauge stick or hard plastic tape, apply paste which will turn color upon contact with hydrocarbons. Record the results of both measurements for each well in the logbook.

FIGURE 3

SAMPLE WEEKLY MONITORING WELL LOG SHEET

Monitoring Well No.	1	2	3	4
1. Date of Sampling				
2. Time of Sampling				
3. Distance from Casing to Ground Water				
4. Distance from Casing to Bottom of Well				
5. Method for Determining Water Levels				
6. Instrument Cleaned (Washed and Triple Rinsed)				
7. Instrument Used (Bailer, Pump, etc.)				
8. Results of Sight and Smell Test				
9. Initials of Person Performing the Sampling				
10. Comments				

Appendix I: Sample Daily Inventory Reporting Log

KEEP THIS COMPLETED FORM ON SITE FOR 3 YEARS

MONTHLY FUEL REPORT/DAILY INVENTORY

Month/Year _____

Facility & Location: _____ Registration Number: _____

Tank Size and Fuel Type: _____ Certified By: _____

Date	Opening Inventory (Book Inventory of Previous Day)	Gallons Pumped	Gallons Delivered	Book Inventory Balance	Closing Stick Inventory	Cumulative Over or <Short>	Inches Water	Initials
Math Check		-	+	=				

Leak Check: Sum of Gallons Pumped (_____) x .01 = _____
IF SUM OF "CUMULATIVE OVER OR SHORT" IS GREATER THAN LEAK CHECK RESULT IT IS
CONSIDERED EVIDENCE OF A POSSIBLE LEAK AND YOU MUST NOTIFY DEP AT (207) 287-2651.

Log Sheet #1

Appendix P: Requirements for a Site Assessment at Facility Closure or Tank Abandonment

1. The purpose of a site assessment at the time of facility closure or abandonment is to determine if discharges of oil have occurred requiring notification of the commissioner and corrective action by the owner, operator or another responsible party.
2. General requirements:
 - A. A site assessment meeting all the requirements of this Appendix must be completed prior to the completion of facility closure or the abandonment of any portion of a facility in accordance with section 11 of this rule.

NOTE: See the accompanying chart on the following page for a summary of the site assessment requirements of this Appendix.

- B. Site assessor qualifications. If a tank or facility is located within a sensitive geologic area, as defined by this rule, the site assessment must be supervised by, and the site assessment report must be certified by, a Maine certified geologist, registered professional engineer, or other persons meeting the requirements of Maine's professional regulation statutes and regulations for geologists or professional engineers practicing in Maine. As provided under 38 MRSA, subsection 563-B(1), closure site assessment for facilities not located in a sensitive geologic area are exempt from the above qualification standards for the person conducting the assessment.
 - C. The findings of all site assessments conducted pursuant to this rule must be presented in a written report with supporting data, addressing the requirements of this Appendix.
 - D. One copy of all site assessment reports conducted pursuant to this rule must be submitted to the commissioner in an envelope endorsed "UST Site Assessment", by the facility owner at the following address within 45 days of tank and piping removal or abandonment in place: UST Program Administrator, MDEP-BRWM, 17 SHS, Augusta ME 04333-0017.

If a site assessment finds evidence of a discharge, two additional copies of the site assessment report must be submitted at the same time, one to the commissioner at the above address and one to the chief municipal official of the municipality within which the facility is located or to the county commissioners if located in an unorganized township.

- E. Site assessment reports must follow the following general format:
 - (1) Summary cover sheet including, owner, operator and facility name, Maine facility and tank registration numbers, date of site assessment and whether evidence of a discharge or leak was found;
 - (2) Purpose of site assessment;
 - (3) Facility and site location;
 - (4) Facility and site history;

- (5) Description of the site assessment methods utilized, including field instrument methods, laboratory methods and quality assurance/quality control (QA/QC) procedures followed;
 - (6) Findings of site assessment; and
 - (7) Recommendations and conclusions.
3. The following information must be included in all site assessments:
- A. Mailing and street address of facility;
 - B. Tax map and lot number;
 - C. U.S. Geological Survey 7 1/2 minute (15 minute if 7 1/2 minute is not available) topographical map showing the precise location of the facility adequate to determine its longitude and latitude;
 - D. A facility layout plan showing locations of property boundaries, tanks, product and vent lines, dispensers, on-site wells or surface water bodies, subsurface waste water disposal systems, dry wells, sewer lines and underground utilities;
4. The following additional land use information must be provided where evidence of a discharge of oil has been found:
- A. A description of surrounding land uses and the extent of public drinking water service to all abutters and the surrounding area; and
 - B. The location of possible contamination receptors including, at a minimum, private water supplies within 300 feet of the facility, public water supplies within 2000 feet of the facility, surface water bodies, utility conduits, and structures with a basement or crawl space.
5. If evidence of a discharge of oil is found, the site assessment must also include the following facility and site history information:
- A. History of site ownership and operation, if known, for previous 10 years, including:
 - (1) Name, current mailing address of all current site and facility owners and operators; and
 - (2) Years of ownership and operation of each previous owner and, if known, operator.
 - B. Past and present land use(s) of site and facility.
 - C. Current and past product storage and distribution system, including:
 - (1) Date of installation of all tanks;
 - (2) Tanks or piping abandoned in place;
 - (3) Size and construction of tanks and piping;
 - (4) Type and length of time specific oil products stored;

- (5) Summary of results of daily product inventory reconciliation for the operating life of current and if available, previous facilities;
 - (6) Tank and piping repairs, replacements and/or removals, and the condition of removed or repaired facility components for the operating life of the facility, if known;
 - (7) All precision test results, if performed, for previous and current facility, if available;
 - (8) Availability and results of leak detection monitoring if any, including ground water monitoring wells;
 - (9) Other evidence of a leak or discharge as defined in section 5(D)(9) of this rule, and associated with the current or a previous facility at the same location;
 - (10) Date and description of all known leaks or discharges on the site including type of oil, quantity lost and recovered, cleanup actions taken and off-site effects, if any; and
 - (11) Summary of work performed and results of previous site assessments and contamination investigations.
- D. A completed copy of the department report form, documenting the department's initial decision concerning the need for and goals of remediation for contaminated soil and, if applicable, ground water.
6. Site Assessment Requirements when Tanks and Piping are Removed:
- A. Tanks, piping and other underground facility components must be inspected visually upon removal for presence of holes, loose fittings and joints, cracks, fractures and evidence of oil stains. If any of the conditions above are found the facility owner or operator shall notify the commissioner of the occurrence of a discharge within 24 hours of discovery.
 - B. The tank and piping excavation must be inspected visually for any evidence of a discharge of oil, including oil stained or saturated soil, strong petroleum vapors emitted from soil or an oil sheen on groundwater in the excavation. The presence of any of the above conditions is considered an indication of a discharge of oil and must be reported to the commissioner within 24 hours of discovery by the facility owner or operator and before the excavation hole is filled. The owner shall immediately proceed with an investigation and corrective action measures in accordance with section 12 of this rule.

NOTE: OSHA regulations governing entering excavations and confined spaces should be strictly followed. Excavations should not be entered if above 20% of Lower Explosive Limit (LEL), or less than 19.2% or greater than 25% oxygen.

- C. The entire facility must be inspected visually for surface spills and discharges. Such spills and discharges must be reported to the commissioner in accordance with section 12(A).
- D. Upon visual discovery of evidence of a leak or discharge of oil at a heavy oil facility and reporting such to the commissioner, the site assessment investigation at the time of closure may be terminated, except where a tank or piping was located on or in bedrock in which case the presence of contaminated ground water must be investigated in

accordance with paragraph 6(E). At all other facilities, investigations must proceed further as required by this paragraph. The site assessment must search for the presence of oil pollution not visible to the human eye and must determine the concentrations of oil visibly evident in soils of the tank and piping excavation. The tank and piping excavation areas must be screened for oil vapors using a field instrument, such as a flame ionization detector (FID) or photoionization detector (PID), calibrated to set points established or approved by the commissioner for the instrument make and the type of oil. Samples must be collected from areas showing the highest readings and analyzed by laboratory analysis, or using the field methodologies described in Appendix Q or another method of similar accuracy and sensitivity approved by the commissioner. The commissioner must be notified by the owner or operator within 24 hours of any laboratory analysis or field jar or polyethylene bag headspace reading equal to or exceeding a notification level shown in the table below. Readings below the notification level do not need to be reported to the commissioner if there is no other evidence or indication of a discharge at the facility. When using a field method for analysis of soil suspected to be contaminated with more than one of the oil products listed in the table below, the notification level for the least volatile oil must be used. Only laboratory results analyzed by a method meeting the requirements of Appendix S will be accepted.

Notification Levels (ppm)

<u>Soil Contaminant</u>	<u>FID</u>	<u>PID</u>	<u>Laboratory</u>
gasoline	100	100	5
kerosene	100	100	10
#2 fuel oil / diesel	100	100	10
waste oil	NA	100	10

NOTE: A list of PID instruments and their calibration set points is available from the department. The department also has developed a protocol whereby manufacturers of other instruments may generate calibration data for department evaluation.

- E. Where a tank or piping run has been installed on or in bedrock without adequate soil backfill or bedding to test for contamination, a minimum of two down gradient ground water monitoring wells must be installed under the supervision of a Maine certified geologist or Maine registered professional engineer. Additional wells may be required by the commissioner for tanks with more than 20,000 gallons capacity. Monitoring wells must be sampled for visual and olfactory evidence of oil as well as for dissolved phase product using a hydrocarbons laboratory analysis method meeting the requirements of Appendix S and appropriate for the oil products stored at the facility in the past. Other comprehensive hydrocarbon laboratory methods may be used if approved by the commissioner. If gasoline was stored at the facility, analyses must include methyl tertiary butyl ether (MTBE) and benzene. The detection of oil must be reported to the commissioner within 24 hours by the facility owner or operator. This subparagraph applies to all facilities required to do a site assessment, including heavy oil facilities.
7. Site Assessment Requirements when Tanks and Piping are Abandoned In Place:
 - A. The requirements of this section apply whenever a facility or any portion of a facility are abandoned in place and are not removed. If a tank, piping section or other underground component is not removed, these requirements only apply to that particular portion of the entire facility.

- B. All visible portions of the facility must be inspected for evidence of a leak, spill, overflow or other discharge, including areas around the fill and vent pipes.
 - C. Evidence of contaminated soils from a tank leak must be determined by either of the methods below:
 - (1) A minimum of two soil borings must be made per tank, located as close as technically feasible to intersect any oil contamination from the surface to below the estimated depth of the tank bottom or to bedrock or below the groundwater table, whichever is shallower. Additional number of borings may be required by the commissioner for tanks with more than 20,000 gallons capacity. The borings must be logged and screened continuously for oil vapors using a photo or flame ionization field instrument as removed from the ground. A sample must be taken from soil showing the highest reading for the jar headspace analysis using the method outline in Appendix Q or another commissioner approved method of comparable accuracy and sensitivity.
 - (2) Other subsurface investigation methods approved by the commissioner.
 - D. If piping is not removed such that entire excavation can be inspected, then a soil gas survey must be conducted along the length of the excavation where physical soil characteristics, ground water depth and product type allow. An alternate subsurface investigation may be conducted in lieu of a soil gas survey if approved by the commissioner.
 - E. When a facility was installed on or into bedrock, when borings encounter bedrock before reaching an elevation below that of the bottom of the tank or piping, or when ground water is encountered prior to reaching the depth below that of the tank or piping; a minimum of two ground water monitoring wells must be installed down gradient, as close as feasible. For tanks greater than 20,000 gallons capacity, the commissioner may require additional monitoring wells. Monitoring wells must be sampled for visual and olfactory evidence of oil as well as for dissolved phase gasoline, diesel fuel or heating oil, depending on the oil products stored at the facility in the past. If gasoline was stored at the facility, analyses must include methyl tertiary butyl ether (MTBE). Only results from a laboratory method meeting the requirements of Appendix S will be accepted. The detection of oil must be reported to the commissioner within 24 hours by the facility owner or operator.
 - F. When the above site assessment procedures for a facility to be abandoned in place are not technically feasible, another procedure may be used when approved by the commissioner prior to the initiation of facility closure.
8. When technically feasible and cost-effective, the commissioner may require ground water sample location and quality data to be submitted in an electronic form compatible with the Maine Geographic Information System and Ground Water Database. The format for such data will be provided by the commissioner.

Appendix Q: Field Determination of Soil Hydrocarbon Content by Jar / Poly Bag Headspace Technique

1. **Introduction.** The following is a procedure acceptable to the commissioner for determination of the hydrocarbon content of soils contaminated only by oil and petroleum products. A soil sample is placed in a sealed jar or polyethylene bag and the volatile hydrocarbons are allowed to come to equilibrium with the jar headspace. The headspace hydrocarbon concentration is then measured with a calibrated photo- or flame-ionization (PID or FID) instrument, approved by the commissioner.
2. **Applicability.** This procedure is intended for estimating gasoline, #2 heating oil, diesel fuel, kerosene, and other chemically and physically similar oil contamination in mineral soils, having water contents between bone-dry and saturation. The procedure is not intended for estimating concentrations of heavy oils, lubricating oils, waste oil, and other low volatility hydrocarbon products. Soil grain size distribution and organic carbon content may effect the partitioning of hydrocarbon between soil, liquid, and vapor phases. Weathering of the hydrocarbon product also will decrease the proportion of volatile and soluble constituents, thereby decreasing instrument response. None of these limitations invalidate the method as a technique for approximation of low-level petroleum hydrocarbon concentrations.

3. Equipment Required.

- A. Shovel; trowel;
- B. Lab containers (VOA or SVOA) of type and quantity for hydrocarbon to be sampled at expected concentrations;

NOTE: Laboratory should be consulted in advance to determine their needs.

- C. Metal dial-type thermometer, -10°C to 50°C;
- D. (Jar headspace method only) Glass, wide-mouthed, metal screw-top, 16 oz. jars, with cardboard lid liner removed, and 1/4" hole drilled through center of lid;
- E. (Jar headspace method only) Roll of heavy duty aluminum foil;
- F. (Poly bag method only) 1-quart, Zip-Lock[®] type polyethylene bags;
- G. Means of measuring 250 gm soil sample, plus or minus 10 gms. (e.g., a "calibrated" container, a "Weight Watchers" spring balance);
- H. Photoionization (PID), or flame ionization (FID) instrument approved by the commissioner;

NOTE: A list of approved instruments and their calibration set points is available from the commissioner. The department also has developed a protocol whereby manufacturers of other instruments may generate calibration data for commissioner evaluation and approval. Copies are available from the Bureau of Remediation and Waste Management.

- I. Calibration equipment for instrument chosen; and

- J. Decontamination equipment including soapy water and clean distilled water in squirt bottles or pressurized canisters.

4. Analytical Procedure.

- A. Determine the location at which the sample is to be taken. If possible, identify an uncontaminated location at the same site from which soil of similar texture and moisture content can be obtained, to serve as a field "blank".
- B. Measure a 250 gm. sample of the soil into a wide-mouthed jar or polyethylene bag. In so far possible, samples should be mineral soil free of vegetation and stones larger than 1/2" in diameter. Seal the samples immediately in the jars by placing a square of foil over the mouth and screwing on the lid, and the bag by zipping the closure. Sufficient air should be left in the bag so that the instrument can withdraw an adequate headspace sample.
- C. Repeat this procedure for three (3) more samples, all gathered within a 2'x2' area.
- D. Shake the jars for 30 seconds to thoroughly mix the contents. If bags are used, they may be kneaded until the contents are uniform.
- E. Measure the samples' temperature by sacrificing one jar or bag. If necessary, adjust all sample temperatures to between 15°C and 25°C by bringing sample containers into a warm vehicle or immersing in a water bath. In warm weather, samples should be kept in a shaded, ventilated area during headspace development and analysis.
- F. Allow at least 15 minutes but not more than 1 hour for soil hydrocarbons to reach equilibrium with the headspace.
- G. If samples are to be taken for laboratory analysis, they should be collected and preserved per laboratory protocols at this time. Preferably, these samples should bracket a wide range of hydrocarbon concentrations including the highest and lowest concentration at the site.
- H. Warm up and calibrate the PID or FID instrument to be used to the calibration set point determined by the commissioner for the make of instrument in use and the product(s) present at the facility.

NOTES:

- 1. These calibration set points have been established by testing the instruments against weathered petroleum headspace surrogates. Therefore no conversion of the readings to their benzene equivalent is necessary.
 - 2. The UV source in PID instruments should be cleaned at least weekly per the manufacturer's recommended procedure. Both PID and FID instruments must be recalibrated after four hours of continuous use, as well as at the beginning of field use, since their calibration may drift with battery condition.
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- I. Shake the jars or knead the bags again for thirty (30) seconds.
- J. Measure the samples' headspace concentration. If the jar headspace technique is used, break the foil seal through the drilled hole in the jar lid using a pencil or nail. Insert the

instrument's probe about 1/2" into the jar. If using the poly-bag technique, insert the probe through the bag opening while squeezing the bag tight around the probe. Record the highest reading that remains steady for 1-2 seconds (i.e., that is not due to instrument needle inertia). Repeat this step until all jars have been measured.

NOTE: Both PID and FID instruments withdraw a headspace sample from the jar. In the jar headspace technique, air replaces this sample, diluting the headspace as it is being measured. In the poly bag technique, the bag collapses as its headspace is used by the instrument. In either case it is important to obtain an instrument reading immediately after the seal is broken -- preferably within 10 seconds. Once a jar or bag has been used, it may not be used again, even if sufficient time is allowed to re-establish headspace equilibrium.

- K. Repeat all steps at each other location of interest at the site. Finally, repeat all steps for the "field blank" obtained from the uncontaminated location.
- L. Average the three readings obtained from each soil sample within each 2'x2' area. Blank results must be reported but must not be used to adjust the readings obtained on other samples.

NOTE: Because calibration set points have been established by testing the instruments against weathered petroleum headspace surrogates, no conversion of the readings to their benzene equivalent is necessary.

Appendix S: Department Approved Laboratory Analytical Methods and Performance Standards for Analyses of Oil and its Constituents in Water and Soil

1. All chemical laboratory analyses of soil and water samples required by these rules must meet the requirements of this Appendix. The commissioner may require test methods and parameters other than those listed in this Appendix to address site specific circumstances.
2. Diesel fuel, heating fuel and waste oil sample testing. Acceptable laboratory methods for the analysis of soil and water for contamination include those listed below.
 - A. Modified Method for Determination Diesel Range Organics (DRO), Maine Health and Environmental Testing Laboratory (HETL) Method 4.1.25, Sept. 6, 1995.
 - B. Waste oil that is not suspected of being a hazardous waste is to be analyzed using the same method as for Diesel Range Organics, HETL Method 4.1.25.
 - C. Heavy oils in soil only, by U.S. Environmental Protection Agency Method 418.1, Total Petroleum Hydrocarbons (TPH).
 - D. Heavy oil - TPH (418.1) will not be accepted for water analyses because of high detection limit (1 ppm).
 - E. Other laboratory methods for diesel fuel range organics, waste oil and heavy oil approved or required by the commissioner, such as indicator parameters, for specific site conditions or circumstances.
3. Gasoline and gasoline constituents sample testing. Acceptable laboratory methods for the analysis of soil and water contamination include those listed below.
 - A. Modified Method for Determining Gasoline Range Organics (GRO), Maine Health and Environmental Testing Laboratory (HETL) Method 4.2.17, Sept. 6, 1995.
 - B. MTBE - U. S. Environmental Protection Agency Method 8260
 - C. Benzene -U. S. Environmental Protection Agency Method 8260
 - D. BTEX -U. S. Environmental Protection Agency Method 8260
 - E. Other laboratory methods for testing for the presence and concentrations of gasoline or its constituents, approved by or required by the commissioner, such as indicator parameters for specific site conditions or circumstances.
4. Performance standards.
 - A. For water analyses by the GRO or DRO Methods, the Minimum Reporting Level (MRL), as defined in the Methods, is to be equal to or lower than the Maine Bureau of Health's published Maximum Exposure Guidelines (MEG), a commissioner approved site specific clean-up standard, or an alternate performance standard approved by the commissioner.
 - B. For soil analyses by the GRO and DRO methods, the Minimum Reporting Level (MRL) as defined in the Methods, is to be equal to or lower than the Maine Bureau of Health's published maximum Exposure Guidelines (MEG), a commissioner approved site specific clean-up standard, or an alternate performance standard approved by the commissioner.

- C. For water analyses, other than GRO and DRO; the Estimated Quantitation Limit (EQL), as determined by EPA guidelines, SW-846, is to be equal to or lower than the Maximum Contaminant Level (MCL) or primary drinking water standard, and in the absence of a MCL, is to be less than the Maine Bureau of Health's published Maximum Exposure Guideline for that test parameter.
- D. For soil analyses by methods other than GRO and DRO; the Estimated Quantitation Limit (EQL), as determined by EPA guidelines SW-846, is to be equal to or less than five (5) parts per million for gasoline analyses and less than 10 parts per million for fuel oil analyses or an alternate performance standard approved by the commissioner..
- E. All laboratory analytical data submitted to the commissioner pursuant to this rule must come from a laboratory certified under the applicable requirements of the Maine Department of Human Services Comprehensive and Limited Environmental Laboratory Rules.

NOTE: Pursuant to GRO and DRO laboratory method descriptions, the presence of a material outside the gasoline or diesel fuel range on a chromatogram should be included on the respective laboratory report.

AUTHORITY: 38 MRSA, section 561 et. seq.

EFFECTIVE DATE: June 5, 1986

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March 28, 1990

REPEALED AND REPLACED: September 16, 1991

EFFECTIVE DATE (ELECTRONIC CONVERSION): May 4, 1996

AMENDED: December 24, 1996

BASIS STATEMENT

As required under the Maine Administrative Procedures Act, 5 MRSA § 8052, sub-§ 5, the board adopted written statements explaining the factual and policy basis for the rule and amendments. The statements include the board response to comments received during the rulemaking process. Copies are available from the department upon request.